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Transmission Ranking Cost Methodology

California Energy Commission Workshop

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Topics

- Objective
- Limitations
- Overview
- Transmission Ranking Cost Development
- Estimating Congestion (Ratepayer Risk)
- Proxy Facilities
- Determining Generation Levels

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Objective of Methodology

- Least-cost Best fit
- Alternative to Cost Estimate from ISO Interconnection Process
- Adhere to all FERC Rules governing Generation Interconnection and Open Access
- Pre-bid information
  - Bidders can effectively structure bid
  - Benefits both developers and ratepayers
- For bid Short-list Selection Purposes *ONLY*
  - Winning bidders *must* go through ISO Interconnection Process

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Challenges

- Transmission planning process – Must have:
  - Network configuration
  - Specific information (Location, sizes, characteristics, etc.) of each load and generator
- Before winning bidders are selected
  - Network configuration – only approved transmission projects
  - Load forecast
  - No generator-specific information

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Limitations

- Based on very limited information
- Cost information for bid short-list selection only
- Use proxy facilities
- No computer simulation for contingencies
- No field check for engineering and environmental assessments
- Augmented with information from off-the-shelf studies if available

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Consideration of Transmission Cost in Bid Ranking (D.04-06-013)

- Generator Cost responsibility - Include in bid price:
  - Direct Assignment Facilities (Gen-tie)
    - Identify if desire PG&E to evaluate potential for sharing
  - Wheeling Charges in non-PTO systems
- Cost Responsibility – Ratepayer
  - Network Upgrades
  - Transmission Adders at Clusters from:
    - CAISO Interconnection Process (SIS/FS)
    - Transmission Ranking Cost Report

http://www.pge.com/suppliers_purchasing/wholesale_electric_supplier_solicitation/renewables2004.html

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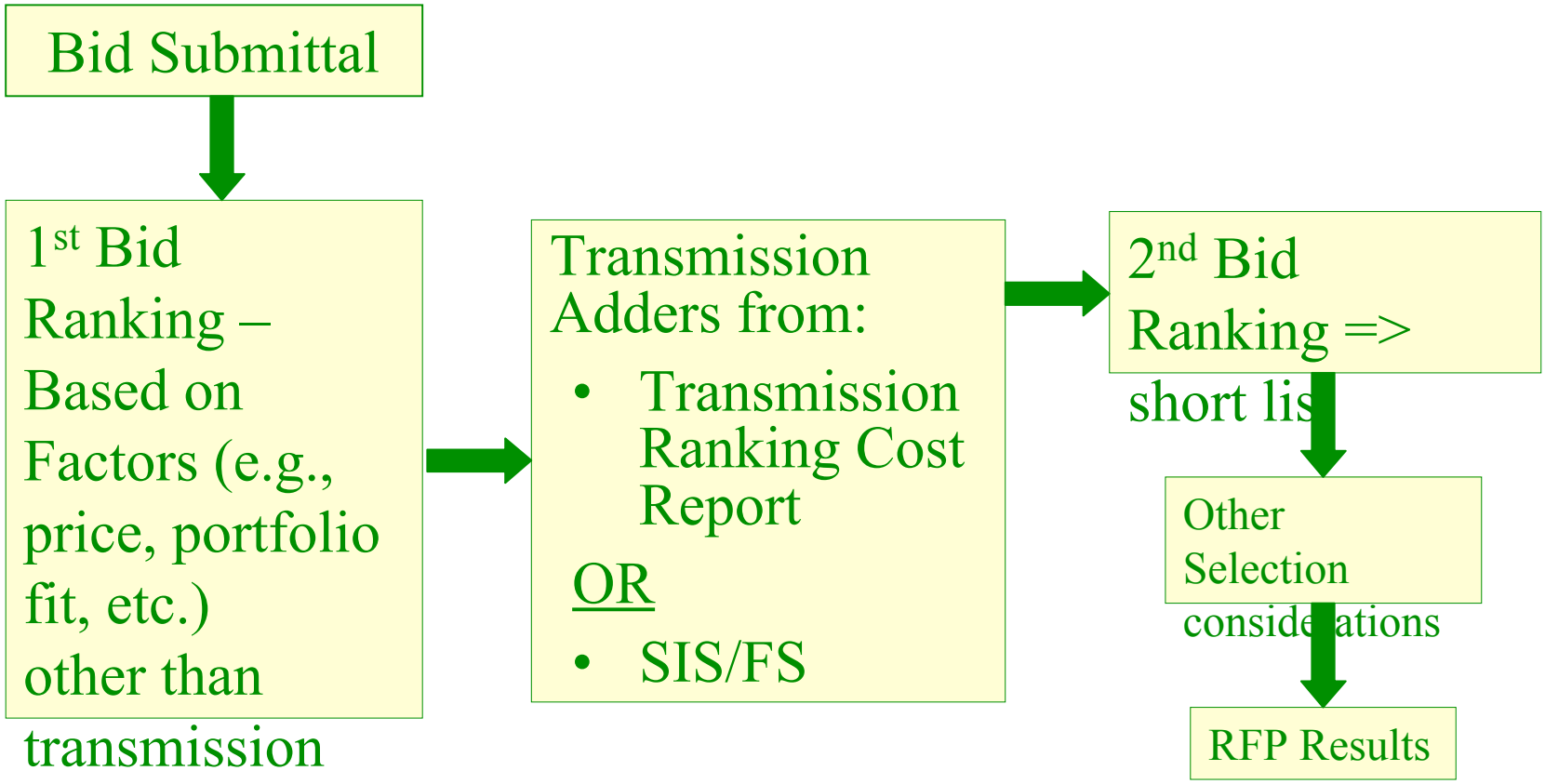
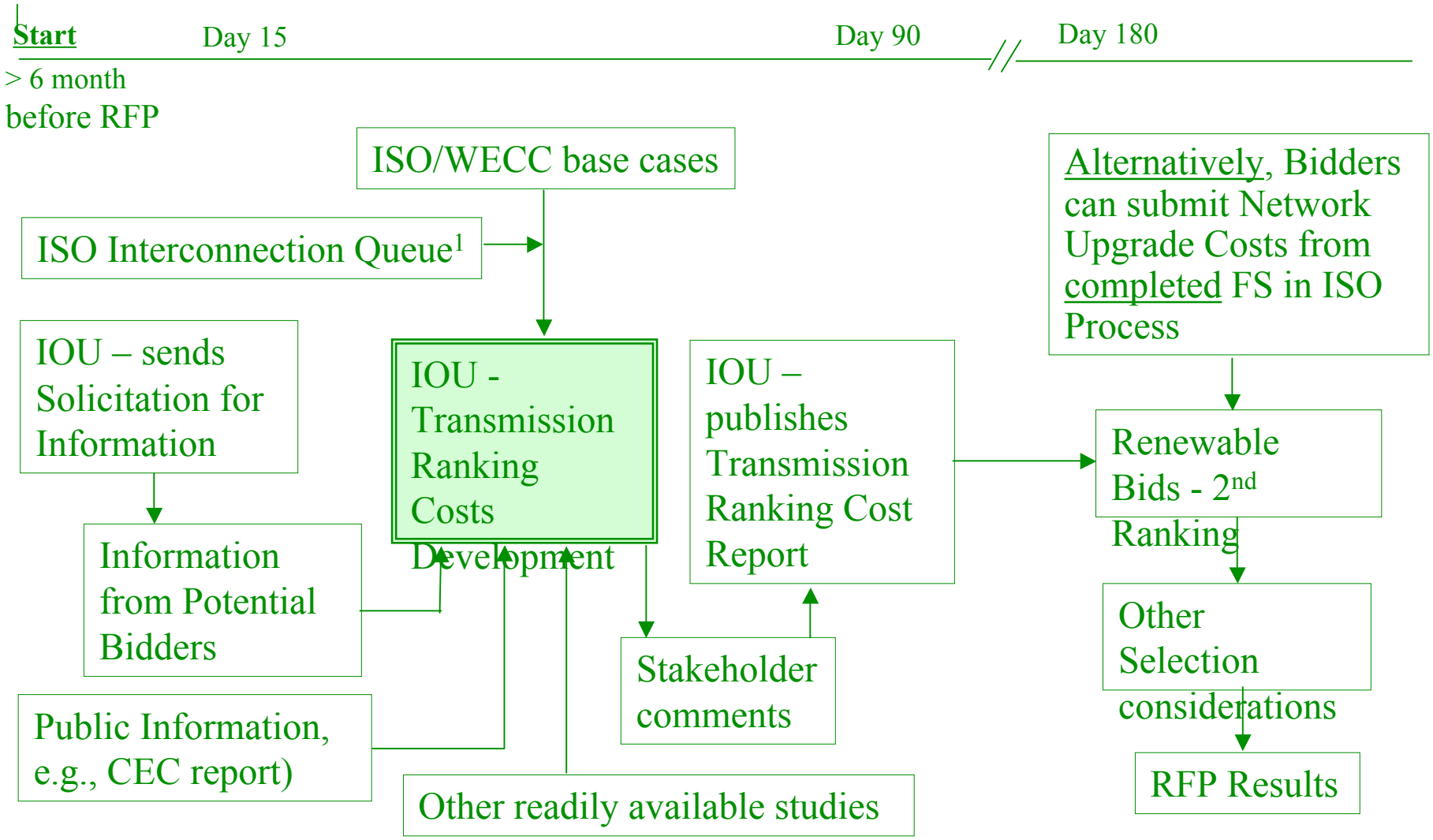
Application of Transmission Ranking Costs

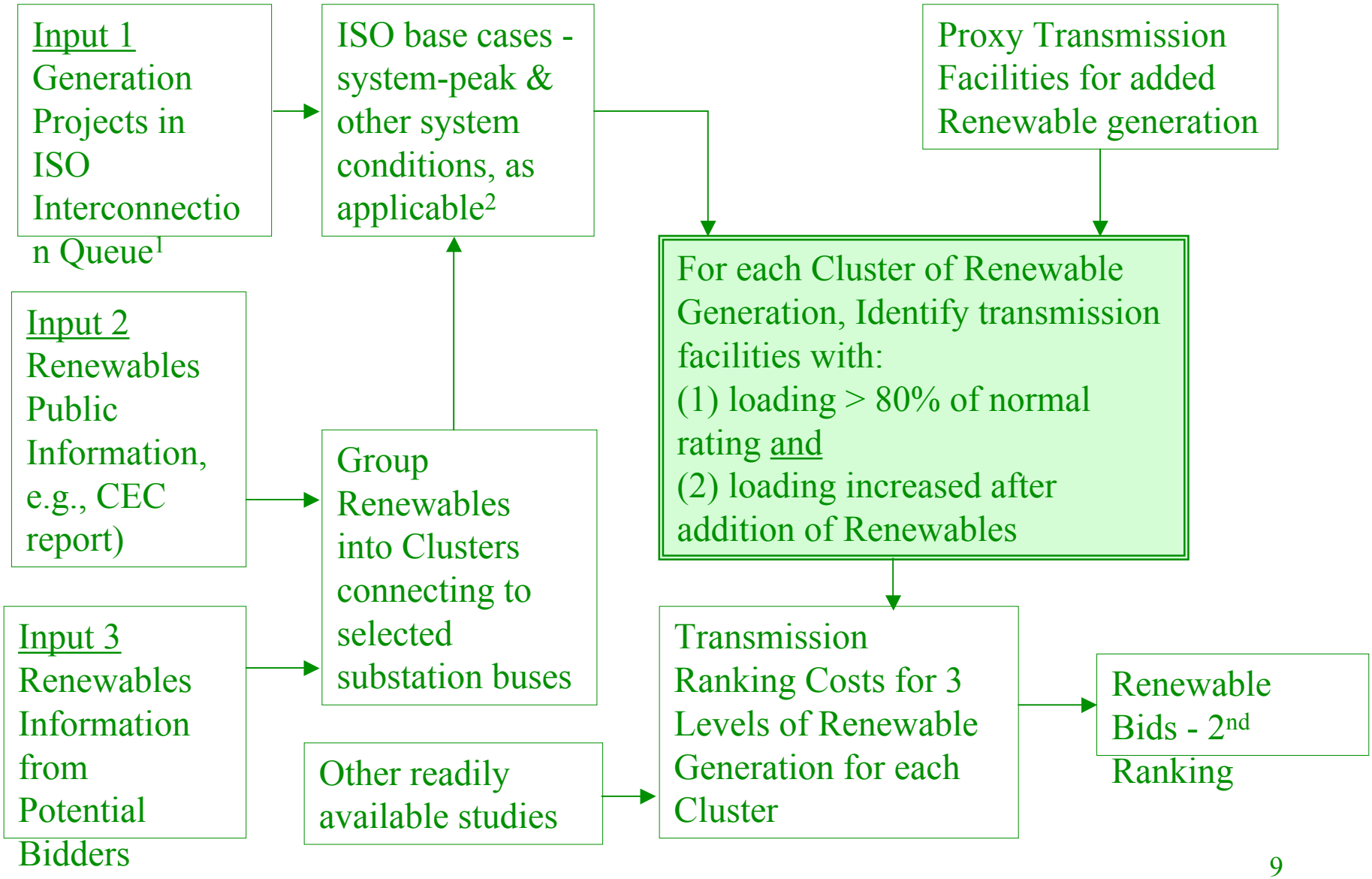


Transmission Ranking Cost Overview



1 Consists of Projects in the IOU's Generation Interconnection Queue, which predates the ISO Interconnection Queue; and Projects in the ISO Interconnection Queue that have paid for the completion of the associated SIS and FS.

Transmission Ranking Cost Development



2. WECC base cases may be used if updated ISO base case is not available

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Estimating Congestion (Ratepayer Risk)

For each Cluster of Renewable Generation, Identify transmission facilities with:

- loading > 80% of normal rating and
- loading increases after addition of Renewables

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Estimating Congestion

Typical emergency ratings:

~ 115% -125% of Normal ratings

For this purpose assume 120%

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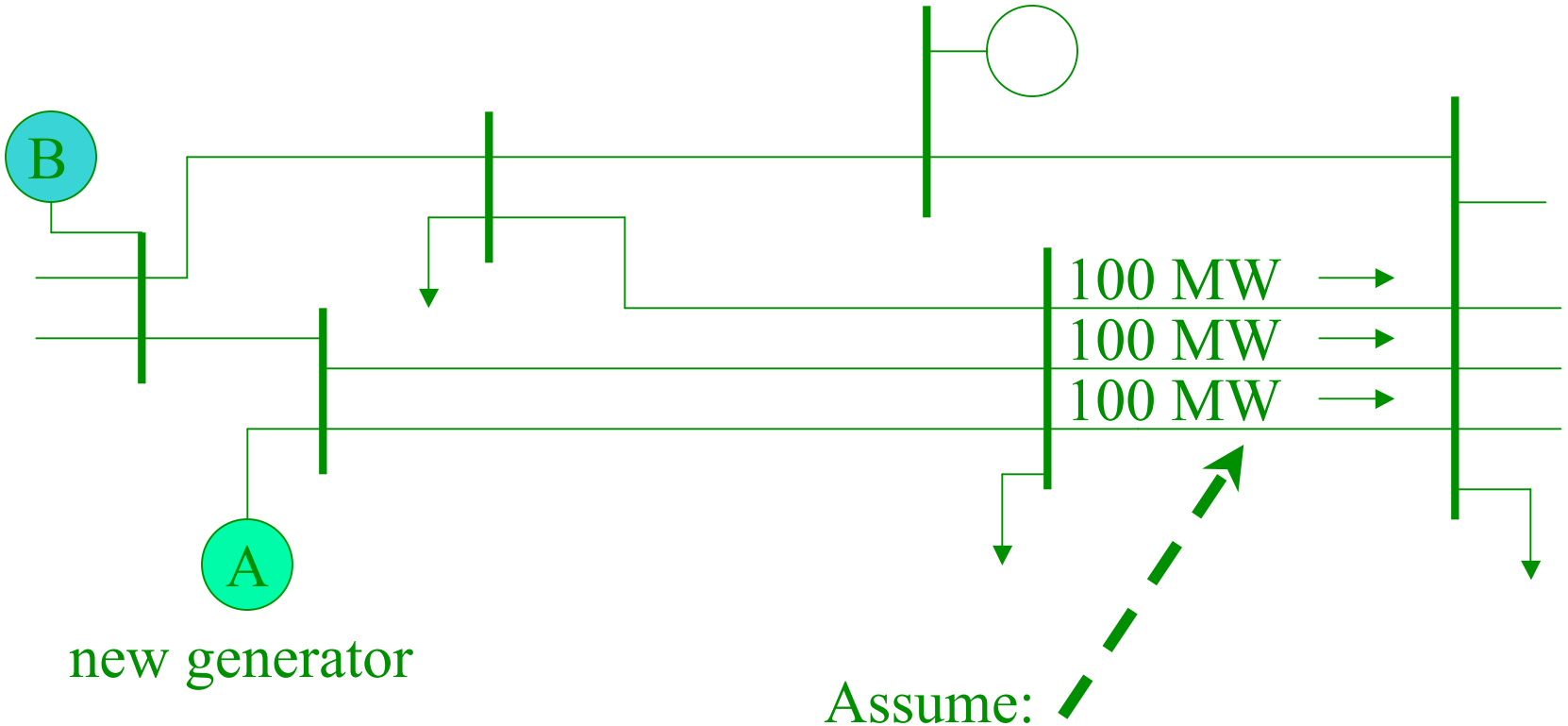
Normal (Pre-outage)



Normal Rating = 100 MW

Emergency Rating = 120 MW

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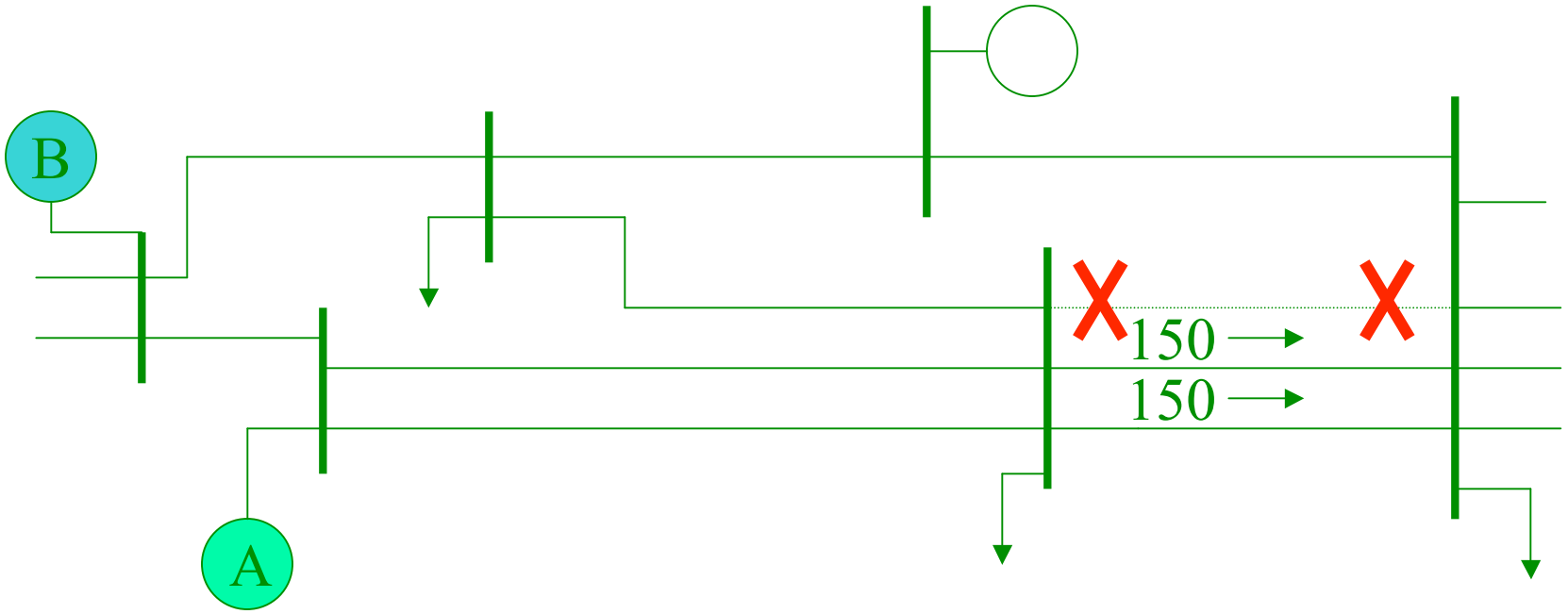
N-1 (Emergency Conditions)



If all power flowing on the outaged line were picked up by the remaining 2 lines, then the loading would be ~150 MW on each remaining line.

For this example, assume loading on remaining two parallel lines increases from 100 MW to 150 MW each

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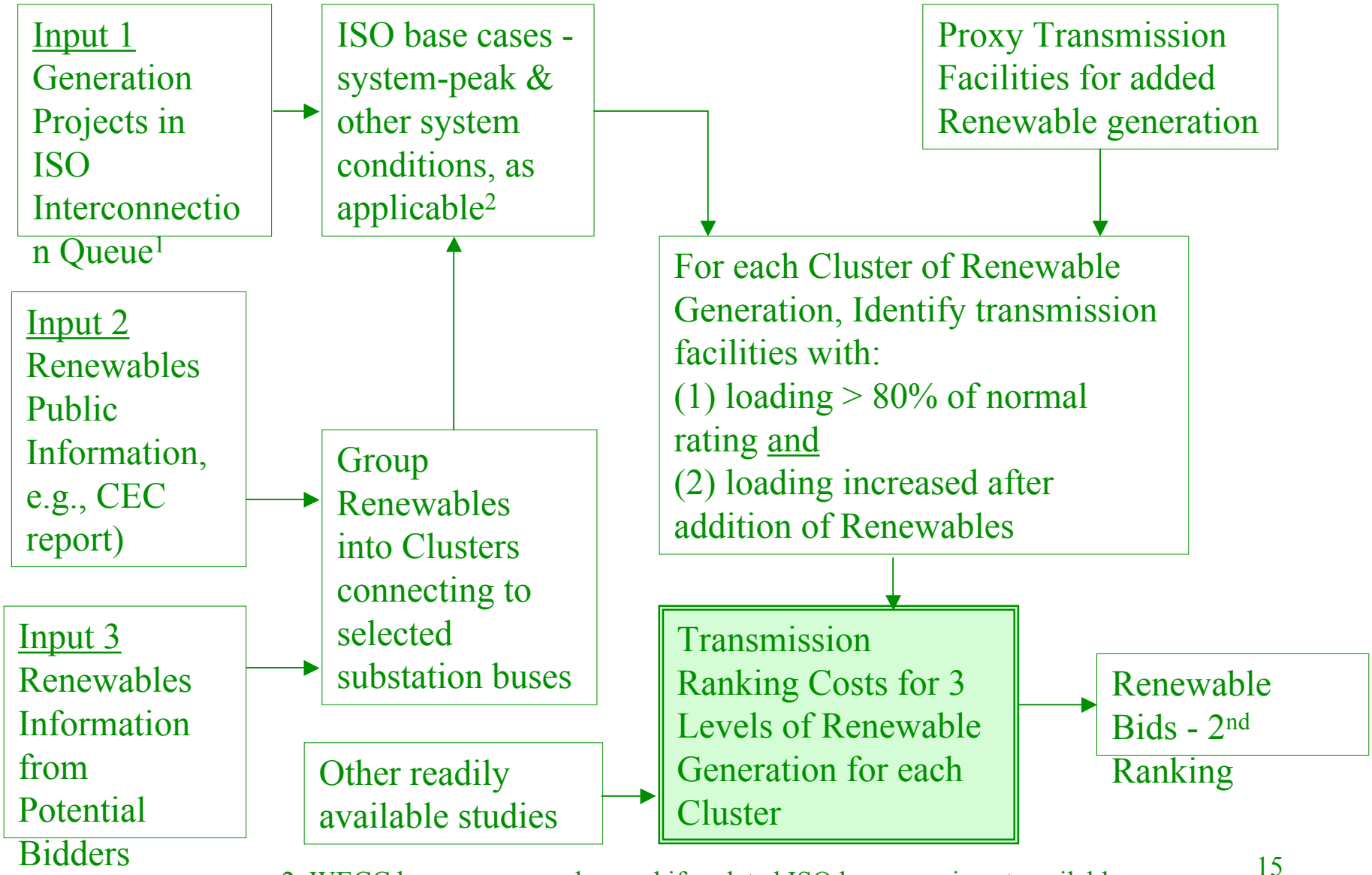
Estimating Maximum allowable Normal loading

- If the the pre-outage loading were 100 MW loading (100% of normal rating), the remaining lines would have been overloaded
- To avoid N-1 emergency overloads, the normal loading will need to be:

  (120/150)*100 MW = 80 MW

  or 80% or less of normal rating

Transmission Ranking Cost Development



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Proxy Facilities

The lesser cost facilities similar to the congested facilities, or the followings:

- If renewable <100 MW, 60 kV line
- If renewable between 100-200 MW, 115 kV line
- If renewable between 200-600 MW, 230 kV line
- If renewable >600 MW, 500 kV line.

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Determining Generation Levels

For each cluster,

- Increase generation until transmission facility loading > 80 of normal rating => Level 1
- Add most reasonable inexpensive proxy facility, increase generation until transmission facility loading > 80 of normal rating => Level 2
- Add remaining bids, identify all transmission facilities > 80 of normal loading => Level 3

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Summary

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- Limit Ratepayer Risk

Questions?